Name: Date:

# Exam: Function Reflections (EXAM version 601)

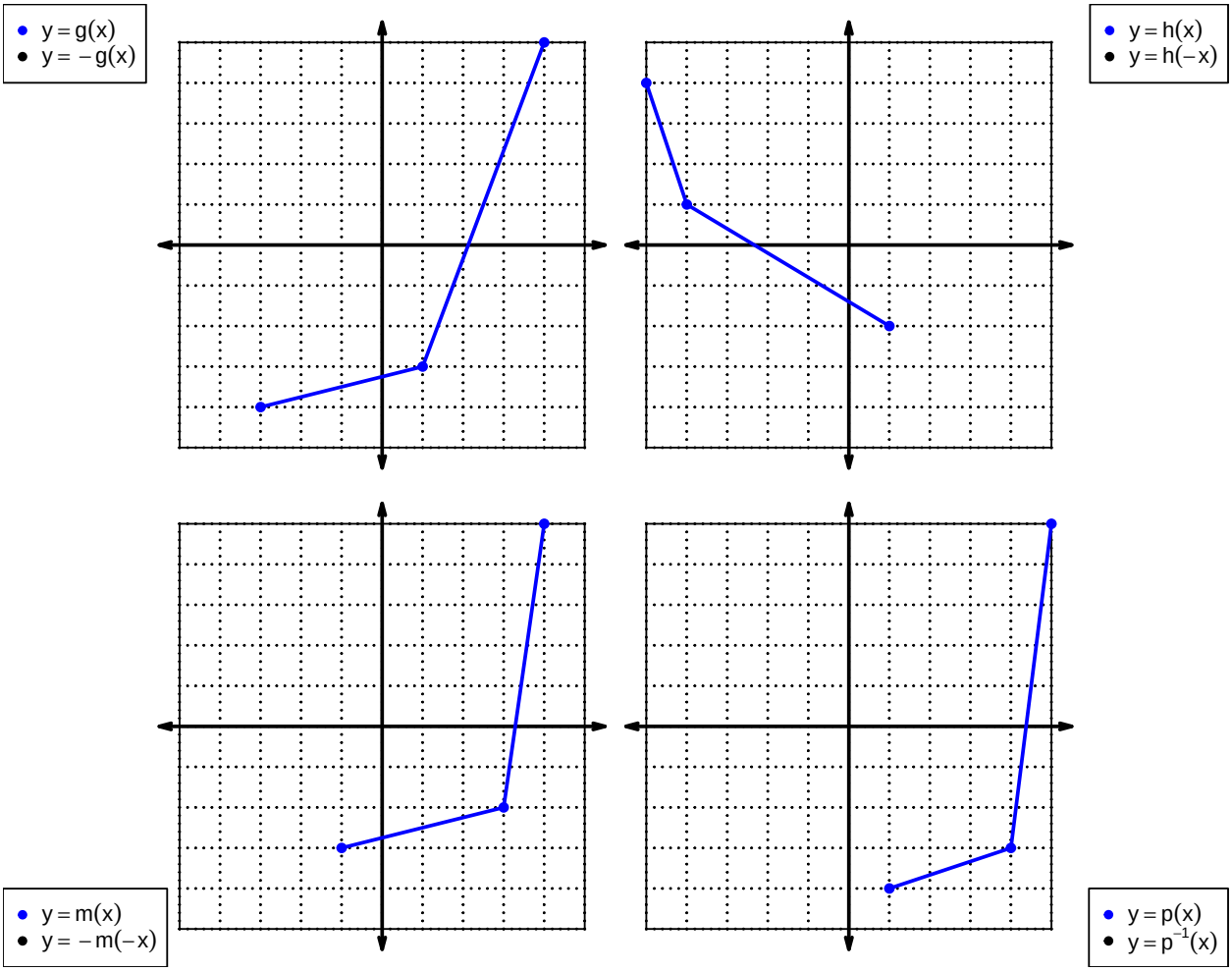
1. (worth 9 points) Let function $f$ be defined by the polynomial below:

$$f(x) \;=\; 7x^5 + 2x^4 - 4x^3 + 5x^2 + 8x + 3$$

Draw lines that match each function reflection with its polynomial:

| Reflections | Polynomials |
|---|---|
| $f(-x)$ | $-7x^5 + 2x^4 + 4x^3 + 5x^2 - 8x + 3$ |
| $-f(x)$ | $7x^5 - 2x^4 - 4x^3 - 5x^2 + 8x - 3$ |
| $-f(-x)$ | $-7x^5 - 2x^4 + 4x^3 - 5x^2 - 8x - 3$ |

2. (worth 20 points) In each $xy$ plane shown below, a function is graphed with blue. Draw the indicated reflections (as a second curve, indicated in legend) with black (or with whatever you have). The $x$ axis is horizontal and the $y$ axis is vertical (as typical), and the scale is equal on both axes.



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For all questions on this page, the functions $f$, $g$, and $h$ are defined by the table below.

| $x$ | $f(x)$ | $g(x)$ | $h(x)$ |
|---|---|---|---|
| 1 | 5 | 3 | 6 |
| 2 | 8 | 6 | 9 |
| 3 | 6 | 5 | 8 |
| 4 | 1 | 9 | 3 |
| 5 | 4 | 8 | 7 |
| 6 | 2 | 7 | 4 |
| 7 | 3 | 4 | 2 |
| 8 | 7 | 2 | 1 |
| 9 | 9 | 1 | 5 |

3. (worth 3 points) Evaluate $h(3)$.

4. (worth 3 points) Evaluate $g^{-1}(7)$.

5. (worth 3 points) Assuming $f$ is an **even** function, evaluate $f(-4)$.

6. (worth 3 points) Assuming $g$ is an **odd** function, evaluate $g(-2)$.

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7. (worth 15 points) A function, $f$, is **even** if $f(x) = f(-x)$ for all $x$ in the domain. A function, $g$, is **odd** if $g(x) = -g(-x)$ for all $x$ in the domain.
   Let polynomial $p$ be defined with the following equation:

$$p(x) \;=\; x^3 + x$$

   a. Express $p(-x)$ as a polynomial in standard form.

   b. Express $-p(-x)$ as a polynomial in standard form.

   c. Is polynomial $p$ even, odd, or neither?

   d. Explain how you know the answer to part c.

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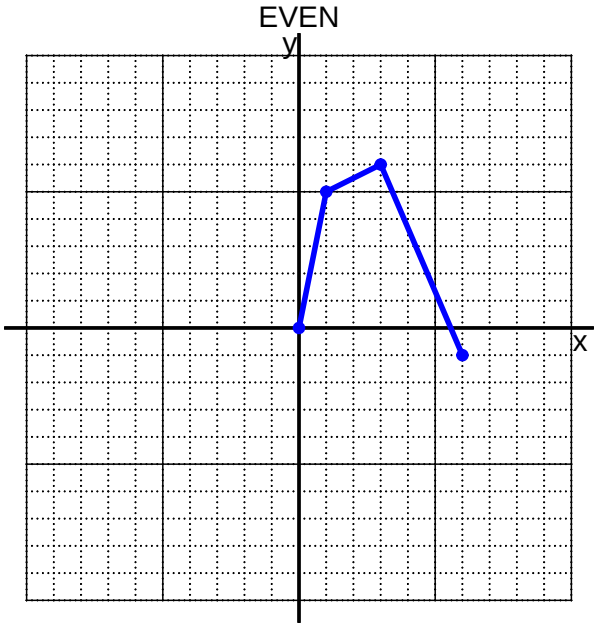
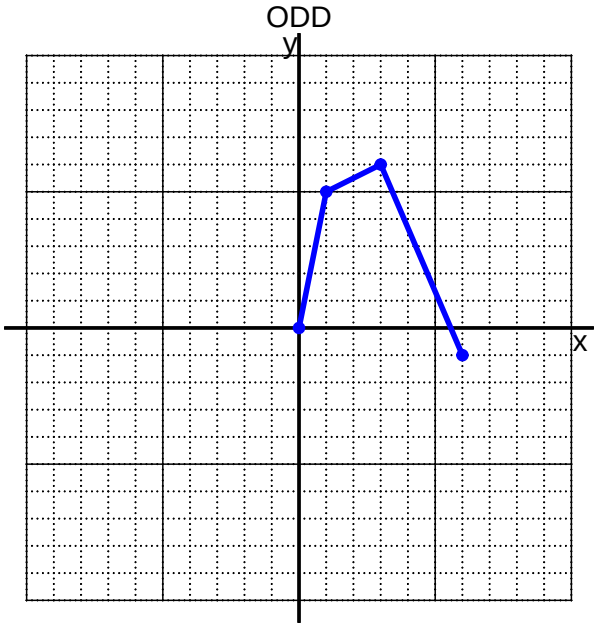
8. (worth 10 points) I have drawn half of a function. Draw the other half to make it even or odd.




9. (worth 10 points) Let function $f$ be defined with the equation below.

$$f(x) \;=\; 3(x-7)$$

a. Evaluate $f(25)$.

b. Evaluate $f^{-1}(42)$.

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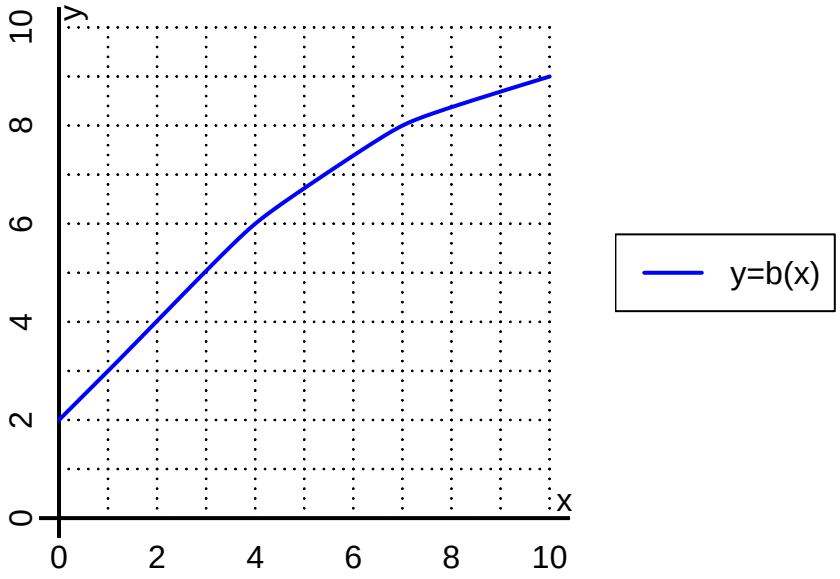
10. (worth 6 points) The function $b$ is represented by the curve $y = b(x)$ graphed below.




a. Evaluate $b(7)$.

b. Evaluate $b^{-1}(3)$.

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11. (worth 18 points) Function $f$ is defined by the table below.

    a. Complete the columns for $-f(x)$ and $f(-x)$ and $-f(-x)$.

| $x$ | $f(x)$ | $-f(x)$ | $f(-x)$ | $-f(-x)$ |
|---|---|---|---|---|
| -2 | -6 | | | |
| -1 | 8 | | | |
| 0 | 0 | | | |
| 1 | 8 | | | |
| 2 | -6 | | | |

b. Is function $f$ even, odd, or neither?

c. How do you know the answer to part b?